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# United States Department of Agriculture,

## FOREST SERVICE—Circular 75.

GIFFORD PINCHOT, Forester.

### FOREST PLANTING LEAFLET.

#### HACKBERRY (*Celtis occidentalis*).

##### FORM AND SIZE.

Hackberry is not a commercially important tree, but throughout the Middle West it is widely planted for a shade tree, and it is suitable for mixture with other species in windbreaks. In form, hackberry is usually characterized by a single stem with warty bark and a broad conical crown. In good situations the tree often attains a diameter of 2 feet and a height of 80 feet.

##### RANGE.

The natural range of the hackberry extends from Massachusetts to Oregon and from Canada to Mexico and Florida. It seldom forms pure forests, but grows in mixture with elm, walnut, bitternut hickory, pecan, ash, oak, and many other broadleaf trees. Although widely distributed, its natural range of economic importance is chiefly limited to the river bottoms and creek valleys of the Middle West. It may safely be recommended for planting on the plains and prairies, from Texas to Canada, but the low economic value of its wood, except for fuel, makes its use inadvisable where better timber trees can be grown. It is an excellent shade tree and rivals the white elm in many of our western cities.

##### HABITS AND GROWTH.

The hackberry will, of course, thrive better on a fertile soil than on a poor one, but its ability to grow on almost sterile soils is one of its best qualities. It is characteristic of the tree to live and bear seed in situations where almost any other tree would die. In the more humid regions it grows on dry and sometimes almost barren soil, while in the semiarid plains it thrives best along the watercourses. A limestone soil seems to be especially favorable.

Its great hardiness where there is a scarcity of moisture makes it one of the best trees for planting in the semiarid regions adjacent to the Rocky Mountains. It will not endure swampy soil.

It is tolerant of shade and consequently thrives in mixtures. In rich alluvial soil the annual diameter growth is sometimes one-third

of an inch, but usually it is much less. Hackberry is sometimes found in situations so unfavorable that fifteen years or more are required for an inch of diameter growth. Its period of most rapid growth is between the twentieth and fortieth years. It reaches an age of from one hundred and fifty to two hundred years.

The hackberry is generally a healthy tree, though often its leaves are covered with insect galls. In case harmful insects appear in threatening numbers, specimens, accompanied by a full description of their depredations, should be sent to the Department of Agriculture for identification and suggestions for their destruction or control.

#### ECONOMIC USE.

The wood of the hackberry is of medium weight, hardness, and strength and is rather elastic. It makes excellent fuel, almost equaling hickory, and is used also in the manufacture of cheap furniture. The technical qualities of hackberry wood resemble those of elm and white ash, and it is occasionally used as a substitute for them. It is not durable in contact with the soil, and, like hickory, when used unpeeled above ground is likely to become worm-eaten. When peeled and properly seasoned hackberry poles serve many useful purposes on the farm.

It is chiefly as a living tree in regions where trees of any kind are highly prized that the hackberry is of greatest economic value. In mixture it serves a good purpose by shading the ground and furnishing litter to enrich the soil.

#### METHODS OF PROPAGATION.

The hackberry is usually propagated from seeds. When a seedling has its top killed it readily sprouts from the root, but large trees rarely sprout after cutting.

The hackberry bears seeds abundantly. The fruit is a bluish-brown drupe about the size of a pea. The thin fleshy layer which covers the stone shrivels and dries and need not be removed before planting. The seeds ripen in the fall and may be sown at once. If spring sowing is preferred the seeds should be stratified in sand and kept buried over winter in a well-drained place out of doors. To fill a box with alternating layers of sand and seeds and sink even with the surface of the ground is a good method of stratification. When filled the box should be covered with a wire screen or boards to keep out mice and then mulched with leaves or straw to protect the seeds from sudden changes in temperature.

The seeds should be sown in drills in good, rich soil, covered not more than half an inch deep, and the soil firmly pressed down upon them. Since hackberry seedlings grow only from 6 to 12 inches

during the first season, they should be allowed to stand in the nursery until 2 years old before transplanting to the permanent site. The root system is branching and fibrous, and for this reason the hackberry is easily transplanted.

#### PLANTING.

The young trees should be set 4 to 6 feet apart. The planter will have to decide for himself whether it is more economical to purchase the seedlings or grow them in a home nursery. If the young trees cost more than \$5 per thousand, the planting of the hackberry for forest purposes is not likely to prove remunerative.

Hackberry will do well when spaced rather closely, and thrives either in mixtures or pure plantations. On the river bottoms of the northern portion of the Middle Western States it forms a good associate with such intolerant species as cottonwood, walnut, and ash.

Hackberry is one of the best species of windbreaks on land too dry for cottonwood in western Minnesota, North and South Dakota, and northern Nebraska. The trees should be planted in a double row, with the rows 3 feet apart and the trees 4 feet apart in the row. The trees of the second row should be set opposite the middle of the spaces separating those of the first row.

On the plains of Oklahoma and Texas hackberry may be planted pure or in mixture with cottonwood, ash, walnut, black locust, honey locust, or Osage orange.

#### CULTIVATION AND CARE.

After a plantation has been established, cultivation must be prolonged sufficiently to prevent the native grasses from gaining a foothold. Weeds should not be permitted to crowd the young trees. The plantations must be carefully protected against fire and grazing.

Approved.

JAMES WILSON,

*Secretary.*

WASHINGTON, D. C., *November 24, 1906.*

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